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AIRPHOTO INTERPRETATION OF DRAINAGE FEATURES OF KOSCIUSKO COUNTY, INDIANA

JULY, 1956

No. 26

by

Merle Parvis

Joint Highway Research Project

PURDUE UNIVERSITY
LAFAYETTE INDIANA

AIRPHOTO INTERPRETATION OF DRAINAGE FEATURES OF KOSCIUSKO COUNTY, INDIANA

TO: K.B. Woods, Director
Joint Highway Research Project

July 26, 1956
File: 17-5-1D-91
C-36-51A

FROM: Harold L. Michael, Assistant Director

Attached is a report entitled "Airphoto Interpretation of Drainage Features of Kosciusko County, Indiana." This compilation is in connection with an airphoto study of the application of the techniques in developing surface drainage maps of Indiana on a county basis. This report was prepared by Merle Parvis, Research Engineer, Joint Highway Research Project.

Included with the report is an ozalid print of a drainage map of Kosciusko County, Indiana. This map was prepared entirely from airphotos.

Respectfully submitted,

Harold L Michael

Harold L. Michael, Assistant Director
Joint Highway Research Project

HLM:bad

Attachment

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OF
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Merle Parvis
Research Engineer
Joint Highway Research Project

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Purdue University
Lafayette, Indiana

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INTRODUCTION

The drainage map of Kosciusko County, Indiana, which accompanies this report was compiled from 9" x 9" aerial photographs having an approximate scale of 1:20,000. These airphotos were taken in the summer of 1951 in connection with the United States Department of Agriculture map program, and the prints were purchased from the Commodity Stabilization Service, Performance and Aerial Photography Division, U.S.D.A. The drainage map was made to the scale of about one inch equals one mile on a base map prepared from the 1937 "General Highway and Transportation Map, Kosciusko County". Slight discrepancies in the base map grid were adjusted to agree with the airphotos.

With the aid of stereoscopes all discernible drainageways were marked on the odd numbered photographs with blue china-marking crayons. This drainage information was transferred from the airphotos by inserting the prints into a reflectoscope and tracing their images onto the base map.

Map symbols are identified by a legend. The names of cities, towns, lakes, and streams are added to facilitate the use of the map. An appropriate title is given the map. When available, approximate elevations of the several towns are shown in small figures enclosed in parentheses (1, p.413); these elevations are railroad elevations presumably at the depots in the various towns and cities.

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1. Logan, W.H., "The Sub-Surface Strata of Indiana", Publication No. 108, The Department of Conservation, Indianapolis, Indiana, 1931.

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General Nature of the County

Geography

Kosciusko County is roughly rectangular in shape. It is about 27 miles long (north-south) and about 21 miles wide (east-west). Its area is approximately 521 square miles (2, p. 139).

Climate

The climate of Kosciusko County is continental, marked by warm summers and moderately cold, moist winters with wide ranges of temperature. The length of the growing season is about 163 days. The mean annual precipitation is 36.03 inches at Winona Lake. The rainfall is fairly well distributed throughout the year; it is lowest in Febraury and highest in May (3).

Physiography

Kosciusko County lies wholly within the Steuben Morainal Lake section of the Northern Moraine and Lake physiographic region of the state (4, p. 66). In respect to its physiographic situation in the United States, Kosciusko County lies within the Eastern Lake section of the Central Lowland province (4, p. 69).

Topography

Kosciusko County has an average elevation of about 855 feet above sea level. Its highest point is about 950 feet, and its lowest point is about 770 feet. Maximum local relief is about 90 feet (4, p. 81). The topography is diversified. It varies from the nearly level outwash plains in the northern part to the hilly portions of the morainic areas.

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2. Ward, L.C., "The Roads and Road Materials of the Northern Third of Indiana," 30th Annual Report, Department of Geology and Natural Resources, 1906, Indianapolis, 1907.

3. "Climate and Man," Yearbook of Agriculture, U.S.D.A., Washington, D.C. 1941.

4. "Handbook of Indiana Geology," Department of Conservation, Indianapolis, Indiana, 1922.

Geology

The surface and near surface geologic ages represented in the county are the Silurian, Devonian, Mississippian, and Quaternary periods (1, p. 413). There are no known rock outcrops (1, p. 413).

Bedrock. "The bedrock formations of Kosciusko County are mainly of Devonian age. A small area in the southern part of the county may have Silurian strata underlying the glacial drift and a small area in the northern part of the county may have rocks of Mississippian age under the drift" (1, p. 413).

Glacial Materials. All Kosciusko County was glaciated. "The glacial covering attains a thickness of more than 300 feet" (1, p. 413).

The Packerton moraine covers much of the southeastern third of the county; this moraine traverses the county in a southwest-northeast direction. The Bunker, the Bremen, and the New Paris moraines (extending at right angles to the Packerton moraine) are located in the southwest, northwest, and northeast parts of the county respectively.

Soils

The soils of Kosciusko County have been developed from glacial materials.

The soil types of the Miami Catena seem to predominate in the areas between the larger streams. Bellefontaine, the soil type on granular hills, belongs to this catena. Coloma soils are also found in these general areas.

The soils bordering the Tippecanoe River in the central part of the county, Eel River in the southeastern part of the county, and Turkey Creek in the northern part of the county, belong to the Fox-Westland, Oshtemo, and Genesee catenas.

Mucks have been mapped as Carlisle, Houghton, and Edwards soils.

The soils of two small areas northeast of Lake Wawasee have been mapped as belonging to the Bono-Toledo-Fulton catena.

In the central-western part of the county there is a small area of soils belonging to the Plainfield-Berrien catena (5).

5. "General Soil Association Map," U.S.D.A., Purdue, May, 1940.

Gravel

Granular materials are plentiful in almost every part of the county. This is verified by a study of the airphotos and by Ward who wrote, "Probably no other county in this part of the state (the northern third) has so much good gravel so well distributed as Kosciusko" (2, p. 191).

STREAM SYSTEMS

Drainage Basins

Kosciusko County lies within three major drainage basins of the state. The northern part of the county is in the Elkhart subdivision of the St. Joseph drainage basin. A small area in the northwestern corner is in the Kankakee drainage basin. The southeastern corner is in the Eel subdivision, and the central part of the county is in the Tippecanoe subdivision of the Wabash drainage basin (4, p. 271).

Principal Streams

The principal stream in Kosciusko County is Tippecanoe River. It heads in Tippecanoe Lake, but the actual watershed extends into Noble and Whitley counties through many connected lakes.

The northeastern part of the county is drained by Turkey Creek. It is the outlet stream of Lake Wawasee and flows in a westerly direction to Milford. It then curves to the north and enters Elkhart County where it joins Elkhart River. Lake Wawasee receives much of its water supply from streams and lakes in west-central Noble County.

The northwestern corner of the county is drained in a westerly direction by Yellow River into Marshall County. Dausman Ditch drains an adjoining area on the south. It too flows in a westerly direction into Marshall County where it joins the Yellow River.

Eel River crosses the southeast corner of the county. It enters from Whitley County and flows across the county in a southwesterly direction for about 3

[illegible] County. [illegible] Creek joins Eel River from the east and [illegible] Creek joins it from the northwest. Several other small streams (including Clear Creek and Silver Creek) drain the south-central part of the county in a southerly direction into Wabash County and then into Eel River.

The Chippewanuck Creek system drains the southwest corner of the county westerly into Fulton County where it joins the Tippecanoe River.

Lakes and Ponds.

There are many lakes in the county. Some of the named ones are as follows:

Lakes

Winona
Wawasee
Tabee
Willets
Hoffman
Crystal
Palestine
Goose
Carrs
Caldwell
Yellow Creek
Beaver Dam
Loon
Higgins
Rock
Silver
Mud
Muskelunge
Fish
Sellers
Johnson

Reeds
Stoller
Wyland
Hammon
Stanton
Shoe
Guy
Pike
Center
Robinson
Dewart
Papakeechie
Shock
Spear
Webster
Tippecanoe
Herron
Barbee Lakes
Ridinger
Daniel

Dredged Ditches

Many of the streams have been dredged. This has been done also to "improve" drainage in the morainic and swampy areas.

DRAINAGE PATTERNS

Drainage patterns of Kosciusko County vary from the almost complete absence of developed drainage systems in the outwash plains to the haphazard patterns of the morainal regions. The dredging of streams and the construction of ditches has added a rectilinear affect to the drainage patterns

[illegible], all parts of the county (6).

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6. Parvis, M., "Regional Drainage Patterns of Indiana," A Thesis, Purdue University, Lafayette, Indiana, 1947.

ACKNOWLEDGMENTS

The author wishes to acknowledge the assistance given by all those persons who have helped in the preparation of this report. Special acknowledgments are due members of the Joint Highway Research Project Advisory Board for their active interest in furthering this study; Professor H.L. Michael, Assistant Director of the Joint Highway Research Project, for his valuable suggestions and review of the report; and to the several individuals in the Airphoto Laboratory who have aided in the compilation of the map.

All airphotos used in connection with the making of the map automatically carry the following credit lines: "Photographed for Commodity Stabilization Severice, Performance and Aerial Photography, U.S.D.A."

JAPP 1966

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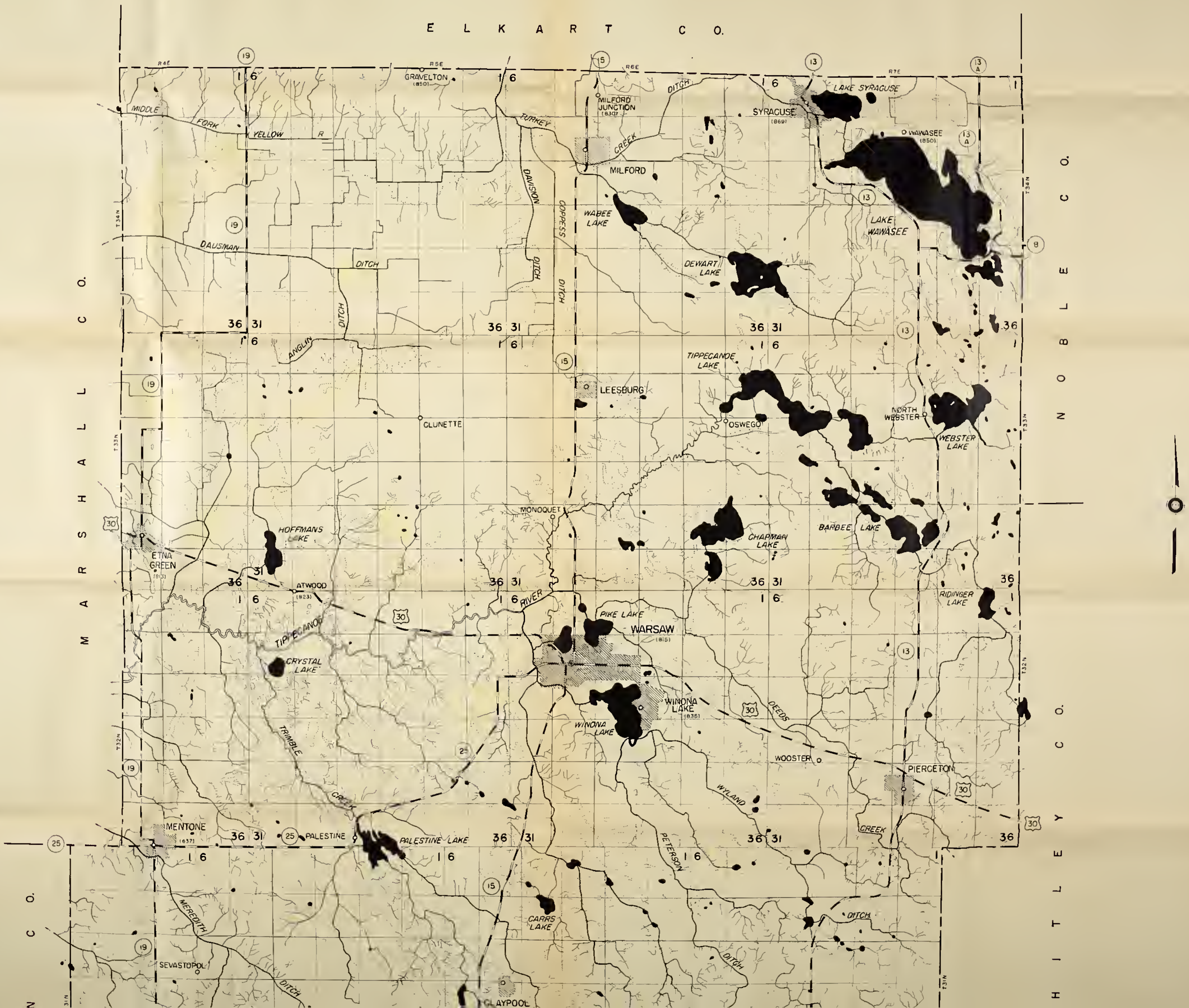

ELKART CO.
MARSHALL CO.
NOBLE CO.
WHITLEY CO.
R4E
R5E
R6E
R7E
T34N
T33N
T32N
T31N
GRAVELTON (850)
MILFORD JUNCTION (830)
SYRACUSE (869)
LAKE SYRACUSE
WAWASEE (850)
LAKE WAWASEE
MILFORD
MIDDLE FORK YELLOW R
TURKEY CREEK
DITCH
DAVISION DITCH
COPPESS DITCH
DAUSMAN DITCH
ANGLIN DITCH
WABEE LAKE
DEWART LAKE
TIPPECANOE LAKE
LEESBURG
CLUNETTE
OSWEGO
NORTH WEBSTER
WEBSTER LAKE
MONOQUET
HOFFMANS LAKE
CHAPMAN LAKE
BARBEE LAKE
ETNA GREEN (813)
ATWOOD (823)
TIPPECANOE RIVER
PIKE LAKE
WARSAW (815)
RIDINGER LAKE
CRYSTAL LAKE
WINONA LAKE (835)
WINONA LAKE
DEEDS CREEK
WOOSTER
PIERCETON
TRIMBLE CREEK
WYLAND
PETERSON DITCH
MENTONE (837)
PALESTINE
PALESTINE LAKE
CREEK
CARRS LAKE
MEREDITH DITCH
SEVASTOPOL
CLAYPOOL
DITCH
C O.
19
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1 6
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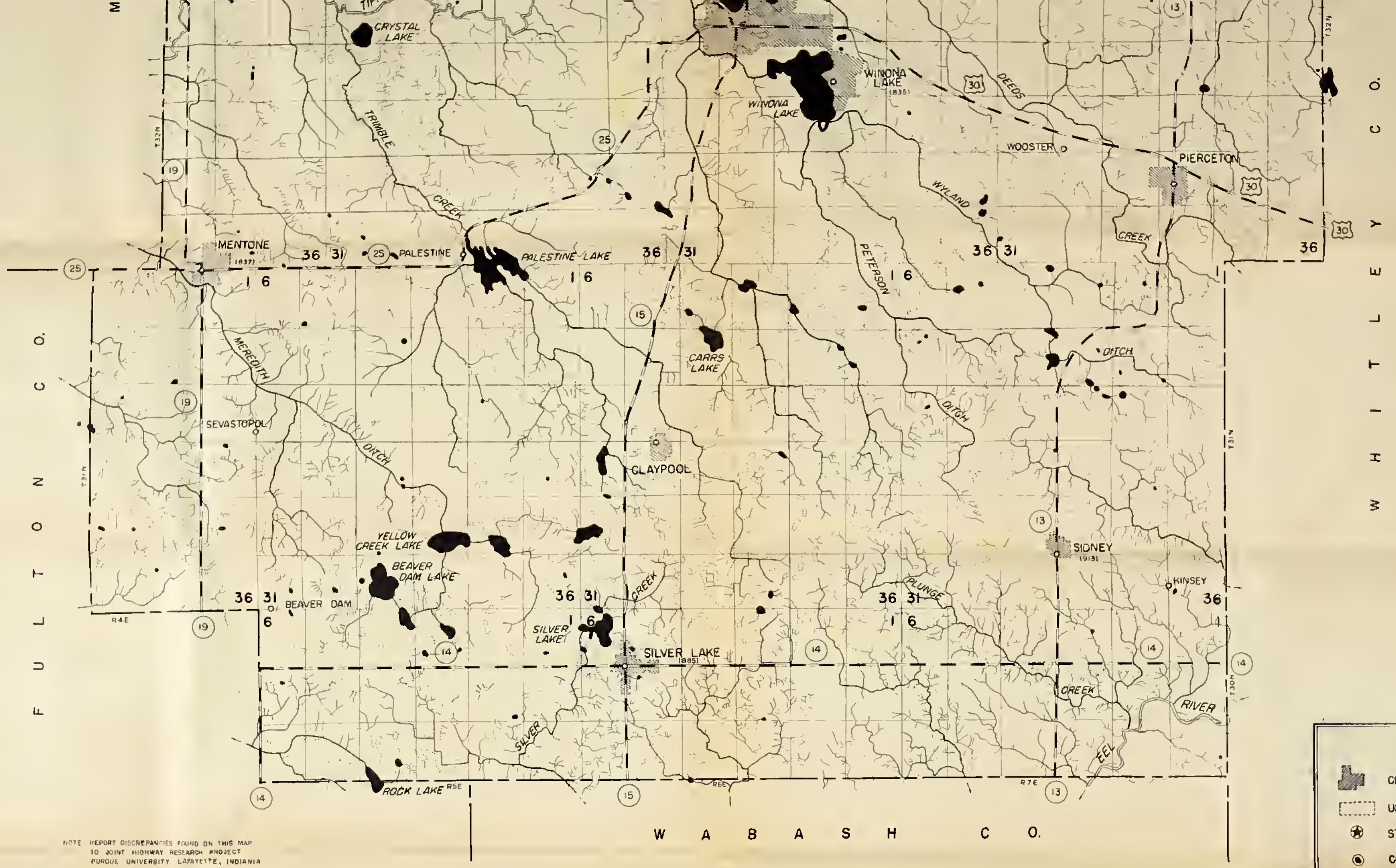

NOTE REPORT DISCREPANCIES FOUND ON THIS MAP TO JOINT HIGHWAY RESEARCH PROJECT PURDUE UNIVERSITY LAFAYETTE, INDIANA

LEGEND

- CITIES AND INCORPORATED TOWNS
- UNINCORPORATED CITY ADDITIONS
- STATE CAPITAL
- COUNTY SEATS
- OTHER TOWNS AND VILLAGES
- U. S. AND STATE HIGHWAYS
- STATE LINE
- COUNTY LINE
- CONGRESSIONAL TOWNSHIP CORNERS
- SECTION LINES
- (900) APPROXIMATE ELEVATIONS
- MAJOR STREAMS
- PERENNIAL STREAMS
- INTERMITTENT DRAINAGE WAYS
- CANALS
- BRIDGES
- LAKES AND PONDS
- INFILTRATION BASINS
- SINK HOLES
- ELEVATED AREAS
- DAMS
- HEADWALLS

DRAINAGE MAP

KOSCIUSKO COUNTY

INDIANA

PREPARED FROM
1951 AAA AERIAL PHOTOGRAPHS
BY
JOINT HIGHWAY RESEARCH PROJECT
AT
PURDUE UNIVERSITY
1956

SCALE OF MILES
1 3/4 1/2 1/4 0 1 2 3 4

PREPARED UNDER THE SUPERVISION OF M PARVIS

POLYCONIC PROJECTION

DRAWN BY : H. Y FANG